



**NORTHROP GRUMMAN**

## ***Emerging Trends with IT Acquisition in DOD***

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# Outline

- Need for change
- Recommendations from the Defense Science Board report, 3/09
- The signing of the NDAA 2010
- Areas to be addressed
- Questions

# Keeping Pace with the Speed of Change



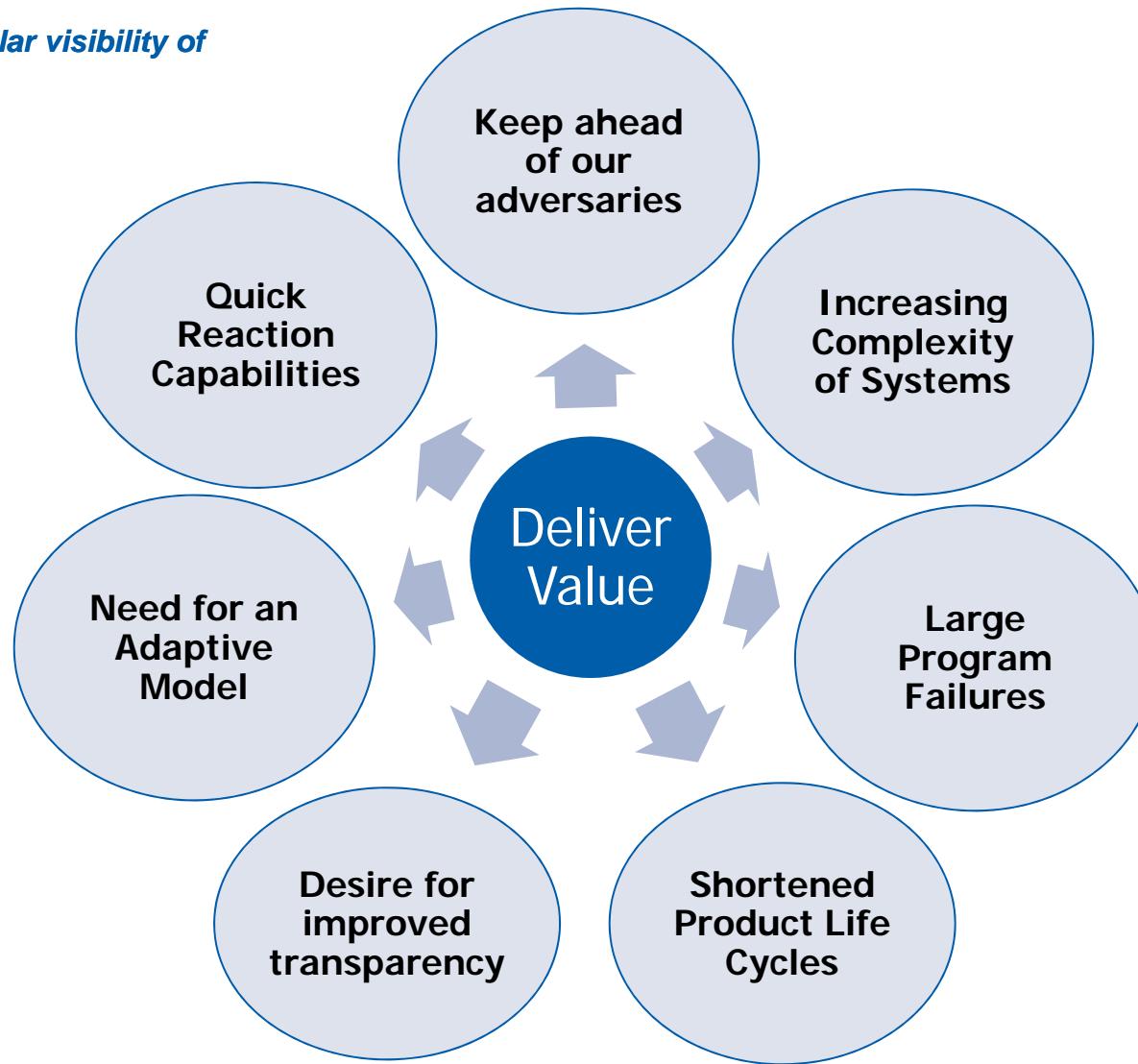
"The Secretary of Defense shall develop and implement a new acquisition process for information technology systems."

"Information technology is pervasive in weapon systems as well as defense business systems."

# What is Driving Change?

*Promote rapid delivery of value and quality to customers*

*Provide timely and regular visibility of the solution*



# Need to maintain our Military Advantage

"There is growing concern within Congress and among Department of Defense (DOD) leadership that the nations' military advantage may be eroding. *The deliberate process through which weapon systems and information technology are acquired by DOD cannot keep pace with the speed at which new capabilities are being introduced in today's information age -- and the speed with which potential adversaries can procure, adapt, and employ those same capabilities against the United States.*"

Are we delivering the capabilities the warfighter needs?  
Are we delivering it when they need it?

Reference: Don Johnson, ODASD/NII

Defense Science Board. (March, 2009). Department of Defense Policies and Procedures for the Acquisition of Information Technology.  
[http://www.acq.osd.mil/dsb/reports/2009-04-IT\\_Acquisition.pdf](http://www.acq.osd.mil/dsb/reports/2009-04-IT_Acquisition.pdf)

# IT Growing Concerns

- Information Technology (IT) has become a national issue via cyber threats and pipeline of available/skilled workforce
- Deliberate and cumbersome process through which IT is acquired by DOD today cannot keep pace
- Unacceptable cost growth and in many cases a failure to meet warfighter needs<sup>1</sup>

Need to improve IT acquisition system

Reference: Don Johnson, ODASD/NII

<sup>1</sup> (2010) House Armed Services Committee Panel on Defense Acquisition Reform Interim Findings and Recommendations

# Acquisition Complexity

- Software is a consistent and persistent thread through all DOD system acquisition programs ...
  - Whereas in 1970, IT accounted for approx 20% of weapon system functionality, by 2000 it accounted for as much as 80%
  - Today it is reported IT can deliver 90% or more of functionality
- Rapidly growing software code base, e.g.,
- Embedded weapon systems (such as, handheld grenade launcher with smart projectiles guided by 2,000 lines of code)
- Increased interconnectivity

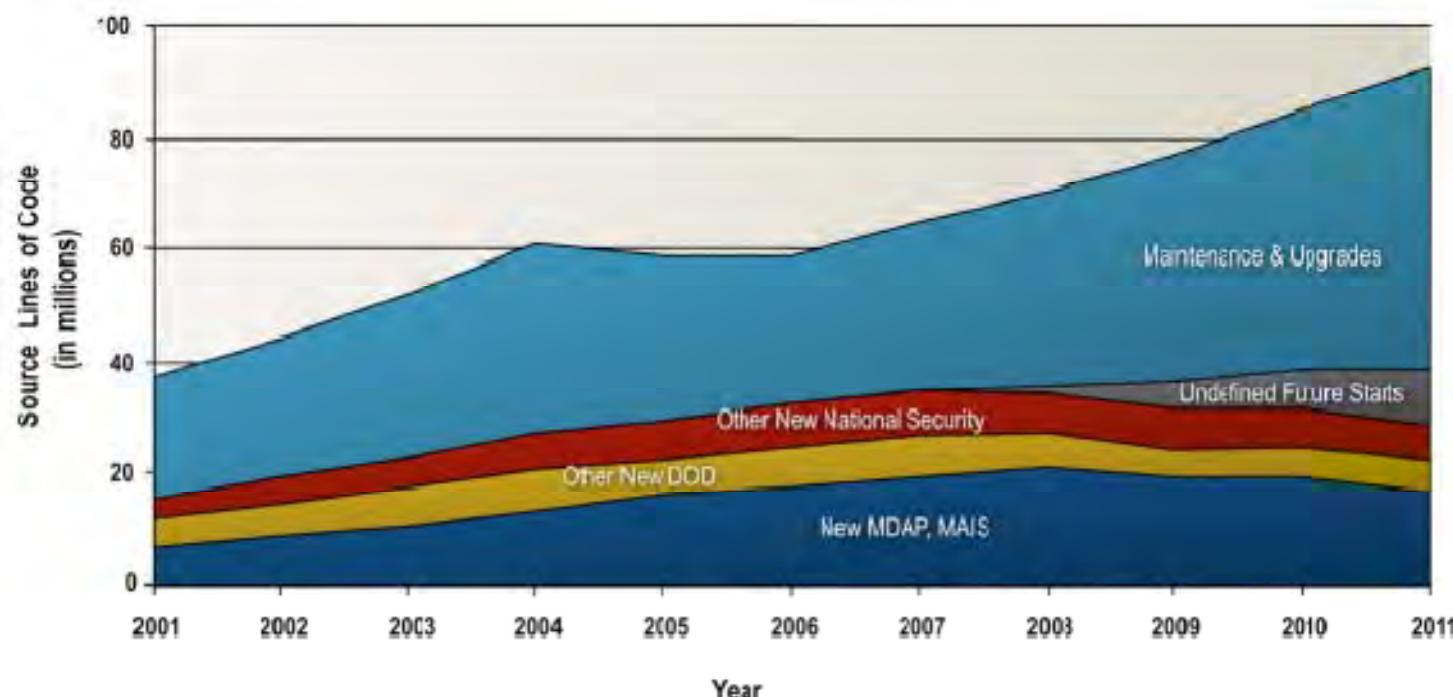


Reference: Don Johnson, ODASD/NII

*Program Manager's Guide for Managing Software* 10 October 2001 Rev 2.0  
<https://acc.dau.mil/CommunityBrowser.aspx?id=24374&lang=en-US>

# Increasing Executable Code

- At the same time, the overall lines of executable code are increasing drastically particularly within the National Security Community

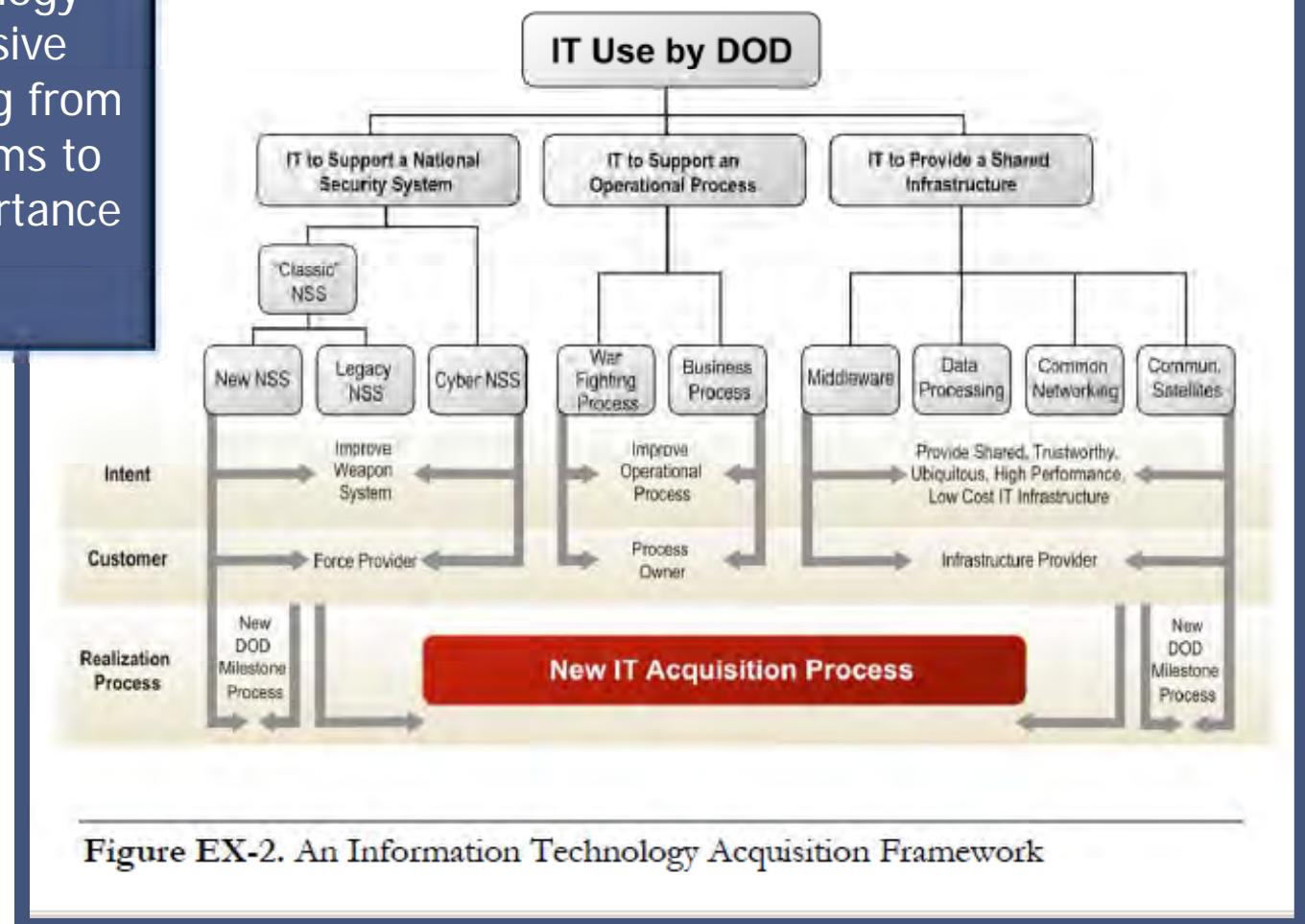


Source: CARD data, Federal Procurement Database System, QSM, CSIS Analysis

Defense Science Board. (March, 2009). Department of Defense Policies and Procedures for the Acquisition of Information Technology.  
<http://www.acq.osd.mil/dsb/reports/ADA498375.pdf>

# Pervasiveness of IT in DoD

Information technology systems are pervasive through DOD, ranging from administrative systems to weapons—their importance is growing



## Significant Reforms Needed to Meet the Challenges of a New Strategic Era

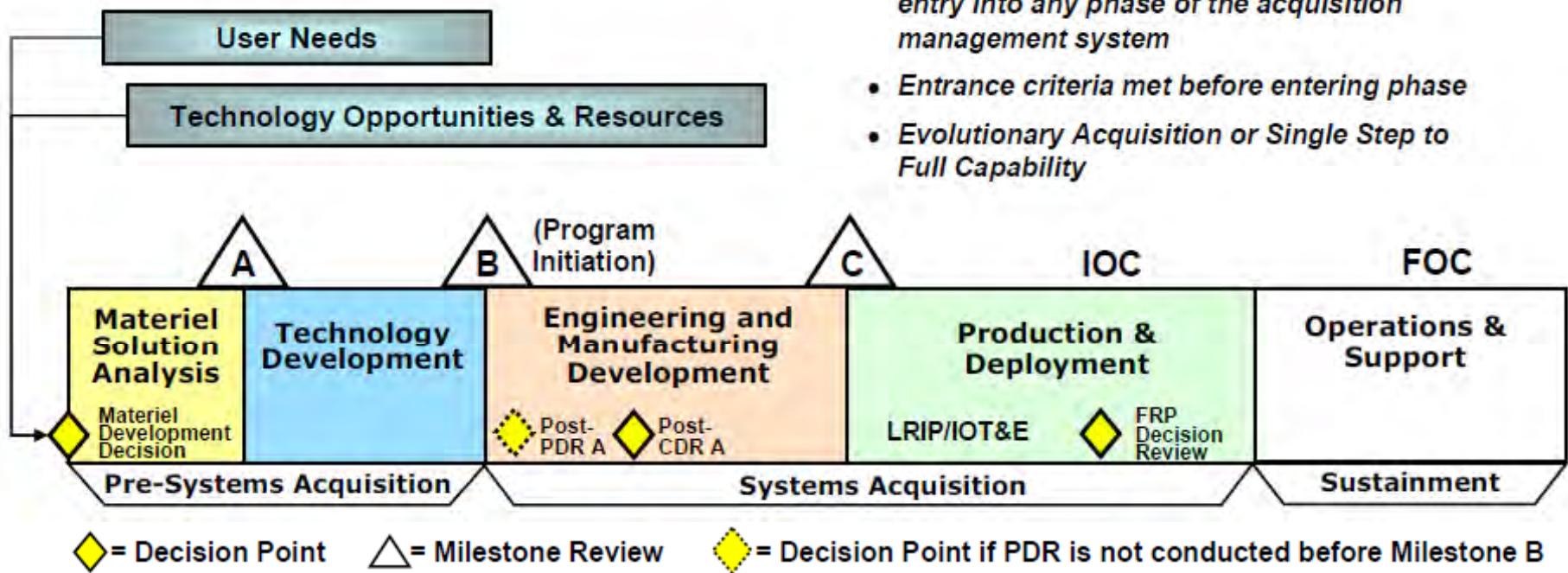
Acknowledged by the former Assistant Secretary of Defense/NII/CIO, 2007

*Much of today's information environment is still...stovepipes and systems in which information is...hidden and hoarded, rather than visible and shared.*

*... existing IT systems cannot talk to each other without the benefit of time-consuming, costly, pre-engineered interfaces*

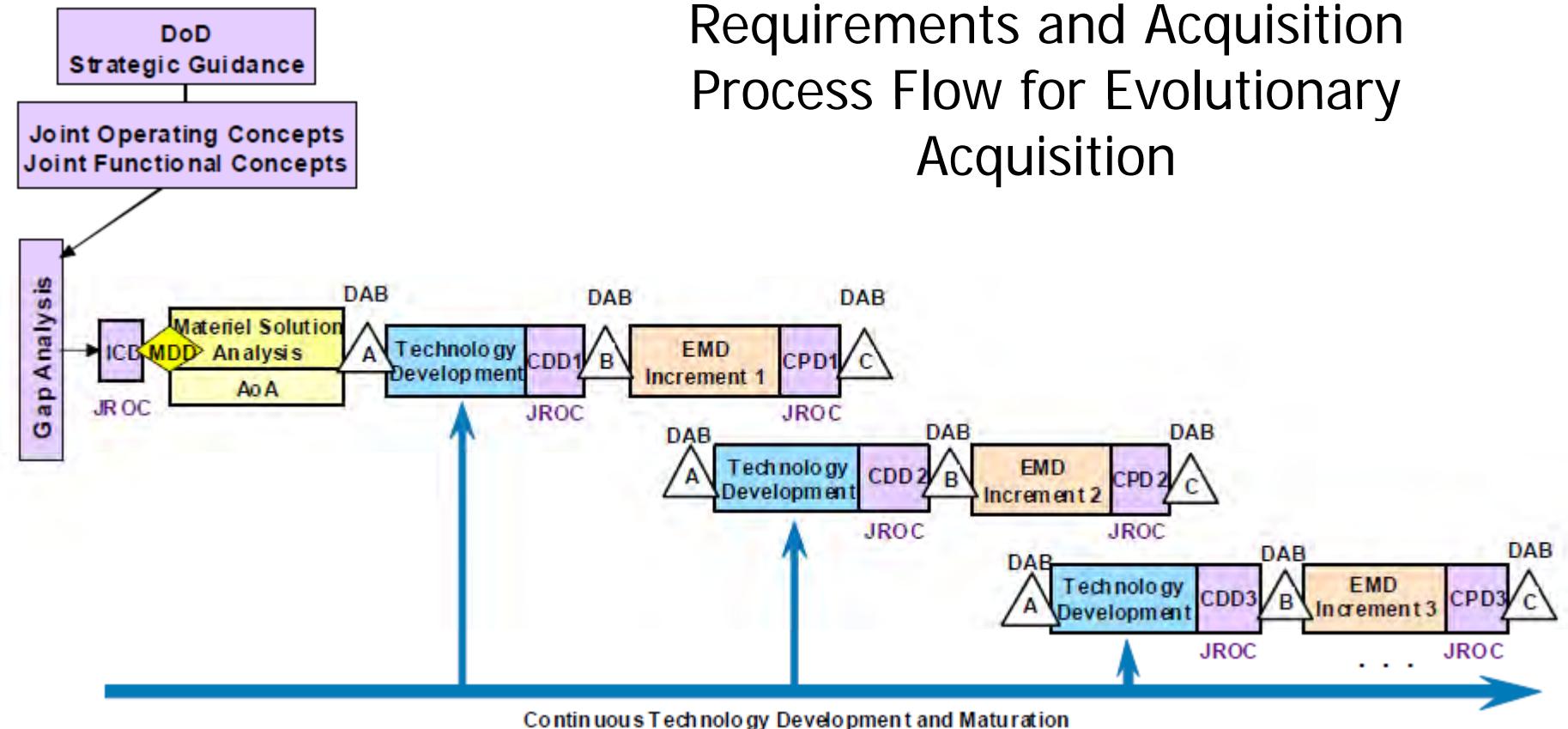
*Enterprise services and net-centric solutions are the only way we can overcome these legacy inefficiencies.*

# As Is: Acquisition Process

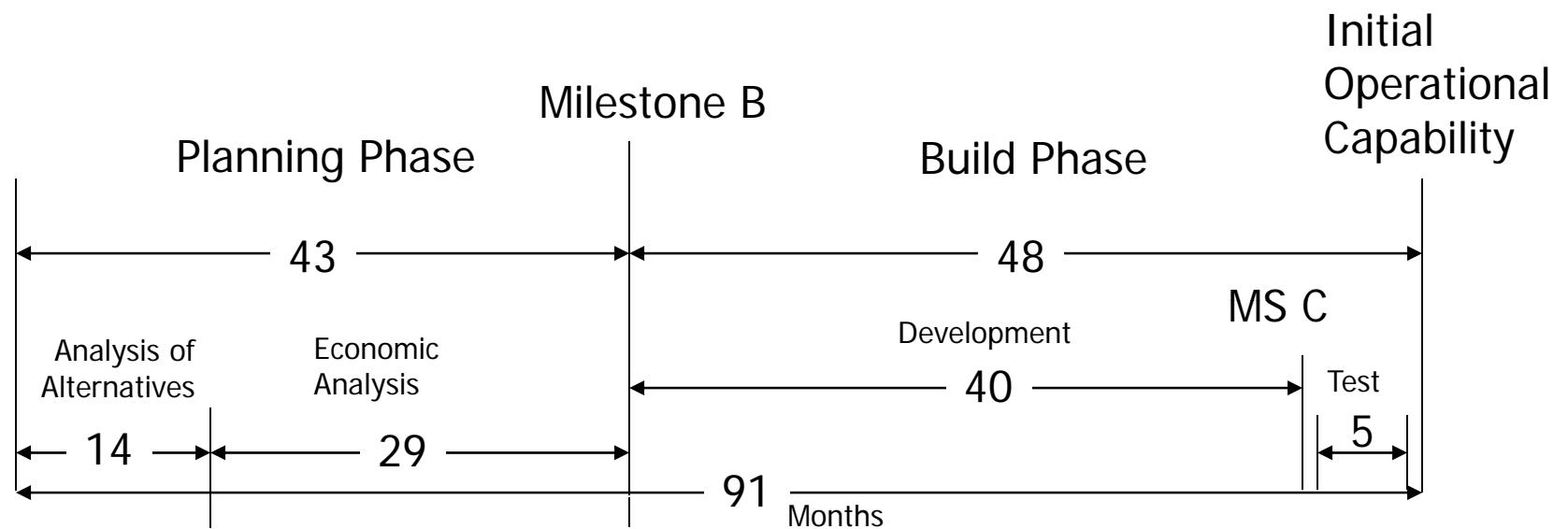


*"Big Bang" approach equally applied to IT and major hardware acquisitions*

# As Is: Acquisition Process (cont)



# Lengthy Acquisition Cycle Time



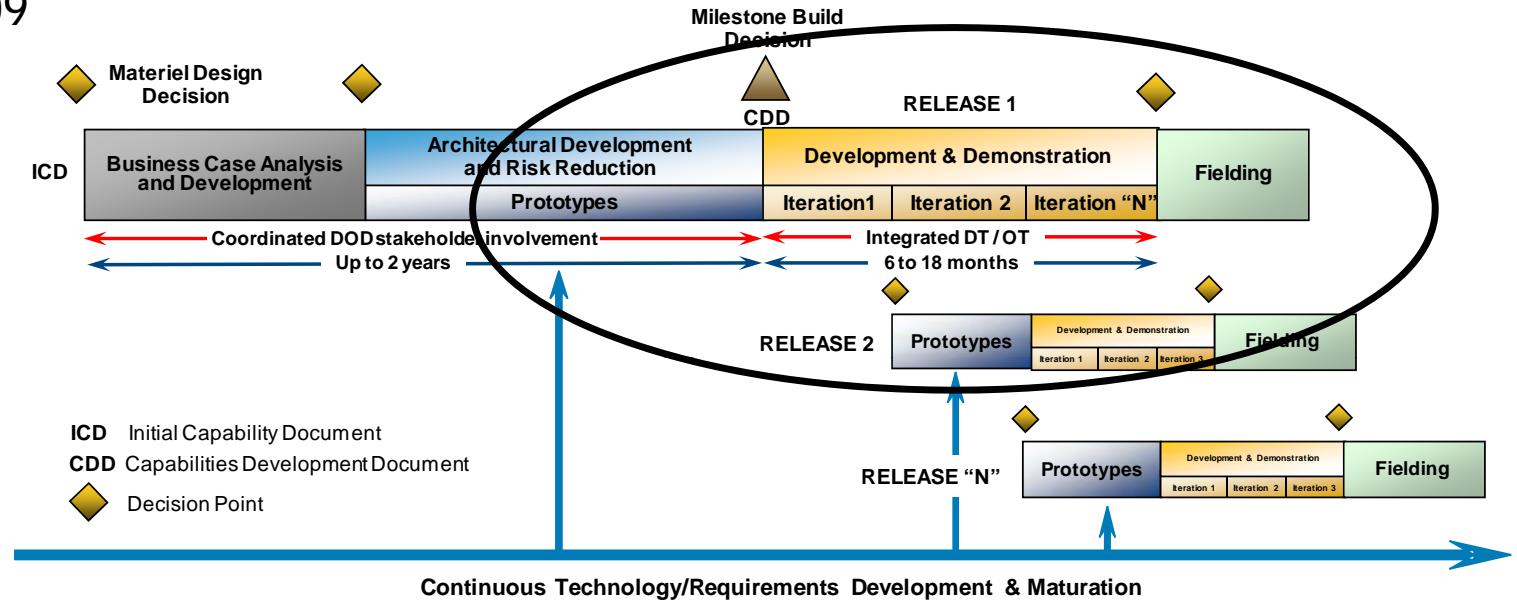
Long Cycle-Time Driven by Processes Developed to Counter a Cold War Adversary In Industrial Age Society

Reference: Don Johnson, ODASD/NII

**\*Metrics calculated by OASD(NII) on 32 Major Automated Information Systems (MAIS)**

# Proposed New IT Acquisition Process

DSB, March 2009



Iterative/Incremental development and demonstration during overlapping releases  
 Requirement Documents established by streamlined Joint Staff validation process  
 Acquisition baseline for "N" releases established at milestone build decision  
 All releases fully funded at milestone build decision  
 Release "N+1" restarts entire process

Defense Science Board. (March, 2009). Department of Defense Policies and Procedures for the Acquisition of Information Technology.  
<http://www.acq.osd.mil/dsb/reports/ADA498375.pdf>

## Proposed New IT Acquisition Process (CONT)

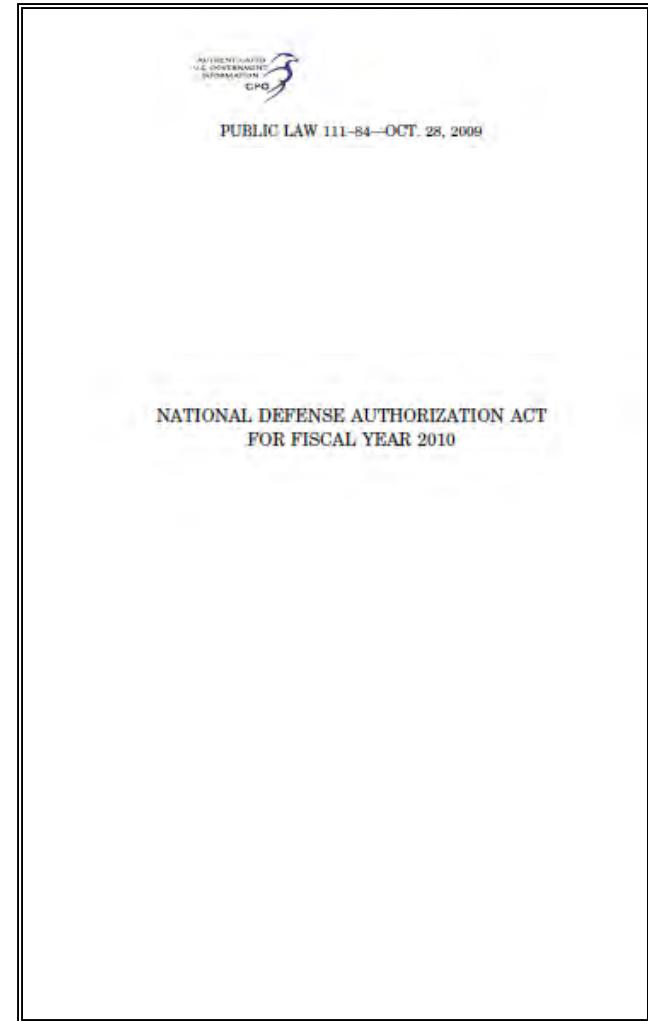
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- Multiple, rapidly executed releases of capability
  - Prioritized content for each release
  - Early operational releases of capability
  - Ability to adapt and accommodate changes driven by field experience
- Early, successive prototyping to support an evolutionary approach
- Modular, open-systems approach—design for change
- Available, full funding of initial release; solid funding stream for next overlapping release(s)
- Involvement of key stakeholders (CIO, PA&E, DDR&E, OT&E, Comptroller, etc.) prior to milestone build decision
- Integrated and continuous development and operational test during development and demonstration phase for each release

# What is NDAA 2010?



- H.R.2647 introduced 6/2/2009
- Title: National Defense Authorization Act for Fiscal Year 2010
- Sponsors:  
Rep Ike Skelton (D - MO)  
John McHugh (R - NY, now Secretary of the Army)
- Became Public Law No: 111-84 on 10/28/2009



# What's in NDAA 2010?



Early and continual involvement of the user

Iterative development

Multiple, rapid releases of capability

Evolutionary prototyping

Open architecture (MOSA)

10 USC 2225  
note.

## **SEC. 804. IMPLEMENTATION OF NEW ACQUISITION PROCESS FOR INFORMATION TECHNOLOGY SYSTEMS.**

(a) NEW ACQUISITION PROCESS REQUIRED.—The Secretary of Defense shall develop and implement a new acquisition process for information technology systems. The acquisition process developed and implemented pursuant to this subsection shall, to the extent determined appropriate by the Secretary—

- (1) be based on the recommendations in chapter 6 of the March 2009 report of the Defense Science Board Task Force on Department of Defense Policies and Procedures for the Acquisition of Information Technology; and
- (2) be designed to include—
  - (A) early and continual involvement of the user;
  - (B) multiple, rapidly executed increments or releases of capability;
  - (C) early, successive prototyping to support an evolutionary approach; and
  - (D) a modular, open-systems approach.

(b) Report to Congress Not later than 270 days after the date of the enactment of this Act, the Secretary of Defense shall submit to the congressional defense committees a report describing the new acquisition process developed under this section.

# What happens next?

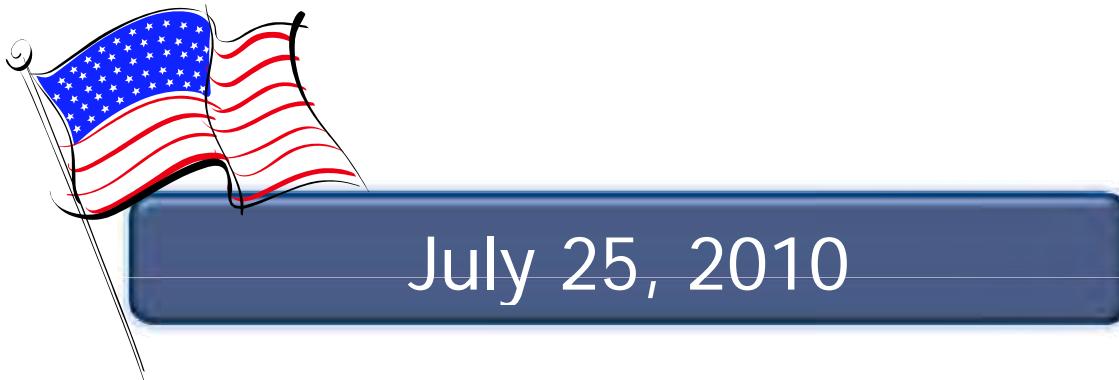
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- Not later than 270 days after the date of the enactment of this Act, the Secretary of Defense shall submit to the Committees on Armed Services of the Senate and the House of Representatives a report on the new acquisition.
- The report required by this subsection shall, at a minimum—
  - Describe the new acquisition process;
  - Provide an explanation for any decision by the Secretary to deviate from the criteria established for such process in paragraphs (1) and (2) of subsection (a);
  - Provide a schedule for the implementation of the new acquisition process;
  - Identify the categories of information technology acquisitions to which such process will apply;
  - Include the Secretary's recommendations for any legislation that may be required to implement the new acquisition process.

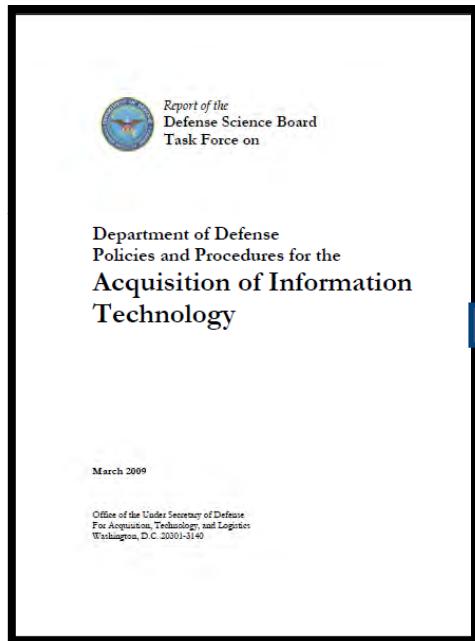
# In other words...



- Report due to Congress no later than July 25, 2010
- Report will propose legislation to implement this IT acquisition process
  - Expect legislation Fall '10
  - Expect legislation to be in effect in '11
- Report will define which categories of IT acquisition fall under this process



# DSB Recommendation



“A new acquisition process for information technology should be developed—**modeled on successful commercial practices**, for the rapid acquisition and continuous upgrade and improvement of IT capabilities. The process **should be agile** and geared to **delivering meaningful increments of capability in approximately 18 months or less**—increments that are prioritized based on need and technical readiness.”

Defense Science Board. (March, 2009). Department of Defense Policies and Procedures for the Acquisition of Information Technology.  
<http://www.acq.osd.mil/dsb/reports/ADA498375.pdf>

# What “IT systems” are we talking about?



“Information technology is **pervasive in weapon systems as well as defense business systems**. In its contributions to both functionality and cost, IT **now represents a considerable proportion of all acquisition programs** underway today—a proportion that is likely to increase in the future.”



*The exceptions are rare... Keeping our war fighters up to date with the most current technologies and capabilities is imperative.*

# Welcome Changing Requirements



- Capabilities prioritized
- Iterative development to allow for reprioritization
- Time-phased releases
- Rapid development and deployment
- Tight coordination between users operators and developers is required to schedule each release

"The objective of this new model is to **develop and deploy the highest priority mission capability first...**"

# Better Informed Cost Estimates



- Each release is treated as a sub-program for purposes of cost and schedule estimating and reporting
- Requires culture change within DoD to support “level of effort” funding for iterative/incremental releases when requirements not fully known
- Estimates are refined after each release to reflect program results based upon realized performance and forward-looking priorities.

# Improved Test, Evaluation, and Certification



- Time-to-Market - Information Assurance – Interoperability
  - Move upfront in the process...not the end (i.e. Release Planning)
  - Acceptance tests captured before development begins
  - Integration and Test automated with focus on continuous integration
  - Build security in
  - Identify dependencies
- C&A must keep pace with the acquisition process
  - Quicker identification of requirements
  - Standard approach to multiple accreditations
  - Reduced time in life cycle development
  - Ease of scalability for large systems
  - Available training for Certifiers and Accreditors
- Focus on the value add
  - How is “success” defined?
  - The needed level of documentation



# Working Together to Make a Difference

- Association for Enterprise Information (AFEI) and the Agile Project Leadership Network (APLN)
  - Mr. Matt Vandergrift (Deloitte) and Prof. Chris Gunderson (Naval Postgraduate School (NPS) are TF 804 co-leads. Mr. Dave Cheseborough, president of AFEI and supports this effort.
  - Working group formed February 26, 2010
  - Members from Industry and Academia
  - ASD (NII) welcomes input by individuals, academia, and industrial organizations. In particular, ASD (NII) encourages AFEI to facilitate a consolidated industrial input. Accordingly, AFEI has chartered TF 804 to rapidly collect, analyze, and organize good ideas from government, industry, and academic experts.
  - By May 15, 2010 the Task Force will submit a report to ASD/NII



***The best way to predict the future is to create it.***

# And This is Different from other Initiatives...How?

- Identifying programmatic means to incentivize change
  - Working across enterprise efforts; remove the stovepipes
  - Programs working together
- Focus on metrics
  - What gets measured gets done
- Change in how we write contracts
- Focus on the people
  - Working with people to implement these changes



# Contact Information

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- Prof. Chris Gunderson, Naval Postgraduate School (NPS)
  - [cgunders@nps.edu](mailto:cgunders@nps.edu)
- Dr. Suzette Johnson, Northrop Grumman
  - [Suzette.johnson@ngc.com](mailto:Suzette.johnson@ngc.com)



# Suggested Reading List and References

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## *Reports and Legislation*

- (2010). Test and Evaluation at the Speed of Need. Defense AT&L.  
[http://www.dau.mil/pubscats/ATL%20Docs/Mar-Apr10/hutchison\\_mar-apr10.pdf](http://www.dau.mil/pubscats/ATL%20Docs/Mar-Apr10/hutchison_mar-apr10.pdf)
- (2010). House Armed Services Committee Panel on Defense Acquisition Reform Interim Findings and Recommendations.  
<http://armedservices.house.gov/pdfs/DARPanelReport/PanelReportInterim030410.pdf>
- (2009). Department of Defense Policies and Procedures for the Acquisition of Information Technology. Defense Science Board. <http://www.acq.osd.mil/dsb/reports/ADA498375.pdf>

## *Agile Development Practices*

- Agile Project Management with Scrum – Ken Schwaber
- Agile Software Development with Scrum – Ken Schwaber and Mike Beedle
- Succeeding with Agile ([www.mountaingoatsoftware.com](http://www.mountaingoatsoftware.com)) – Mike Cohn
- And many others...

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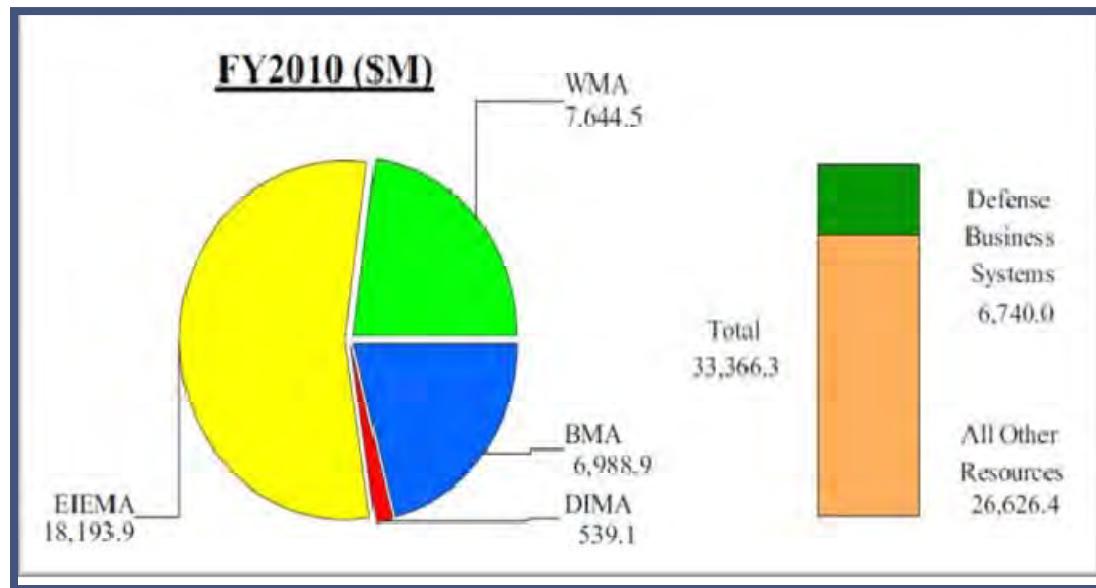
# Why is this legislation needed?

- RAND study on the cost growth of 35 weapon systems driven equally by
  - cost estimating errors
  - requirements growth
- Together, account for almost two thirds of total cost growth
- The current acquisition process is poorly designed for the acquisition of information technology.
- Takes too long to get capabilities to the warfighter

Are we delivering the capabilities the warfighter needs?  
Are we delivering it when they need it?

## More on IT....

- The DAR Interim Report (3/4/2010) states “Information Technology, which includes everything from hardware and software systems to data standards to commonly agreed-upon architecture frameworks, has completely permeated the national security enterprise.”
- IT Mission Areas include: Business, Enterprise Information Environment, Defense Intelligence, and Warfighting.



Reference: DAR, <http://armedservices.house.gov/pdfs/DARPanelReport/PanelReportInterim030410.pdf>